INVESTIGATION OF THE VACUUM FLASHOVER DISCHARGE AS A PLASMA SOURCE

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In the previous research [1] it was registered that the vacuum flashover produced a multiple ionized accelerated plasma flow. There [1] was used RADAN 150 [2] - the generator of high voltage short duration pulses with the fixed parameters (150kV, 4ns). The principles of a creation, formation and acceleration multiple charged ions still unrevealed. This research is dedicated to the experimental investigation of the plasma parameters depending on a duration, amplitude and current of the pulse. There were used two types of generators. First - generator RADAN with amplitude of 150kV and duration of pulse 5ns. Second - the pulse cable generator with fixed durations of the pulse: 5ns, 35ns, 50ns and 100ns. The dielectric material was the high pressure polyethylene. The electrodes were made from copper. There were used coaxial and linear arrangement of electrodes. Gap between anode and cathode was 1mm and 100mkm for cable generator and 1cm for the RADAN.

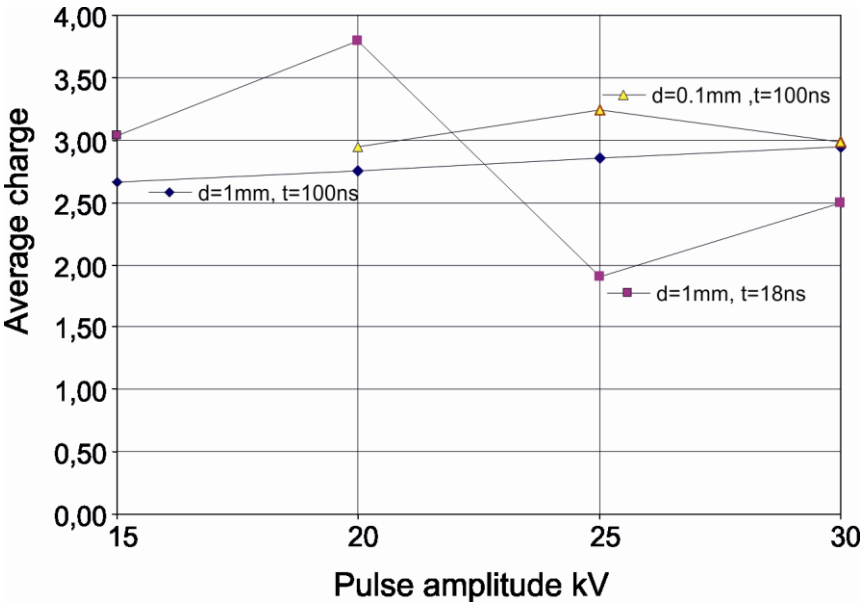

Fig. 1. Dependence of average charge state on pulse amplitude.

The experiments show that ion energy and mass-charge composition doesn't change if we will modify an electrode arrangement, pulse amplitude and anode-cathode gap. Only one regularity was revealed: total ion charge depends on time of

the discharge and area of the dielectric surface that vacuum flashover discharge passes over. It was revealed that there is instant dependence of ion energy on ion charge. Formation of ion charge composition establishes for about 5 ns. Dependence of average charge state on pulse amplitude are presented on figure 1.

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СИНТЕЗ ТОНКИХ ПЛЕНОК НИТРИДА АЛЮМИНИЯ МЕТОДОМ ПЛАЗМОХИМИЧЕСКОГО ОСАЖДЕНИЯ

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PLASMA CHEMICAL SYNTHESIS OF THIN FILMS OF ALUMINUM NITRIDE

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Aluminum nitride thin films were grown on a fused quartz, silicon and titanium substrates using the metal organic plasma enhanced chemical vapor deposition (MO-PE CVD). The parameters of the synthesis routine were controlled by the NANOFAB-100 (NT-MDT) plasma-chemical etching and deposition unit. Surface topography and film thickness were characterized by the means of the atomic force microscopy. UV-VIS spectroscopy was applied to measure the optical transmission spectra. Results of the measurements were in a good agreement with the independent data.

Наноструктурные модификации нитрида алюминия находят широкое применение в различных приложениях микро- и оптоэлектроники. Для получения тонких слоев AlN наиболее распространенными способами являются молекулярно-лучевая эпитаксия и металлорганический пиролиз из газовой фазы. Как правило, эти методы подразумевают проведение химических реакций при тем-